

Professional Development Course

Course Title: Iowa Core Mathematics: Teaching Fractions in Grades 3-6

Course Learning Goals:

- Teachers will understand the content and instructional shifts for teaching fractions resulting from adoption of *Iowa Core Mathematics*.
- Teachers will understand the grade-specific expectations and cross grade-level learning progressions of the *Iowa Core Mathematics* fraction standards.
- Teachers will understand and implement research-based instructional strategies to build students' understanding of fractions and algebra.

Session 1 Success Criteria:

- Teachers will identify key content and instructional shifts resulting from implementation of the Iowa Core fraction standards.
- Teachers will explain the potential of developing fraction understanding with Equal Sharing problems.
- Teachers will describe the difference between partitive and measurement division problems.

Session 2 Success Criteria:

- Teachers will classify student work for Equal Sharing problems according to the five common strategies (see *Extending Children's Mathematics* p.25).
- Teachers will describe the *Iowa Core Mathematics* fraction standards teachers can develop through the use of Equal Sharing problems.
- Teachers write Equal Sharing problems based on the needs of their students.

Session 3 Success Criteria:

- Teachers will classify fraction word problems according to the problem situations described in Table 2 of *Iowa Core Mathematics*.
- Teachers will identify the common strategies for solving Multiple Groups problems (see *Extending Children's Mathematics* p.62).
- Teachers will describe the importance of the number line diagram in *Iowa Core Mathematics* and explain ways to help students use this model.

Session 4 Success Criteria:

- Teachers will classify student work for Multiple Groups multiplication and measurement division problems according to the common strategies (see *Extending Children's Mathematics* p.62).
- Teachers will describe the *Iowa Core Mathematics* fraction standards teachers can develop through the use of Multiple Group problems.
- Teachers will apply properties of operations to solve computational problems.

Session 5 Success Criteria:

- Teachers will identify evidence of student understanding of mathematical structures when solving fraction problems.
- Teachers will describe the importance of the properties of operations in *Iowa Core Mathematics*.
- Teachers will plan and implement a fraction lesson with the goal of making students' relational thinking explicit.

Session 6 Success Criteria:

- Teachers will identify fundamental ideas related to fraction equivalency.
- Teachers will use efficient and flexible strategies to order fractions by reasoning about their size.
- Teachers will plan and implement a lesson to develop student understanding of fraction equivalency or order.

Session 7 Success Criteria:

- Teachers will describe how to use Multiple Groups problems to develop student understanding of addition and subtraction of fractions.
- Teachers will classify Partial Groups problems as multiplication, partitive division, or measurement division.
- Teachers will use contextual problems to begin to make sense of multiplication and division of fractions.

Session 8 Success Criteria:

- Teachers will classify addition and subtraction situations for fractions according to *Iowa Core Mathematics* Table 1 (page 92).
- Teachers will explain how to solve problems involving multiplication and division of fractions.
- Teachers will plan and implement a lesson on fraction computation.

Session 9 Success Criteria:

- Teachers will explain teacher actions to help students develop the Standards for Mathematical Practice when teaching fractions.
- Teachers will analyze sample assessment items on fractions from the Partnership for Assessment of Readiness for College and Careers (PARCC) and the Smarter Balanced Assessment Consortium (SBAC).
- Teachers will study “Progressions for the Common Core State Standards in Mathematics (draft) Number and Operations—Fractions, 3–5.”

Session 10 Success Criteria:

- Teachers will develop a plan for teaching *Iowa Core Mathematics* fraction standards.